Invasive Species Monitoring Guidelines
(6 May 2004, Draft version 3, Bradley A. Welch)

Monitoring Invasive Species in the NPS: Roles and Responsibilities

Several NPS programs play an active role in monitoring invasive species. The scope of this activity varies widely among and within programs, however. Below is a preliminary list of relevant NPS programs and a brief description of their roles and responsibilities as they pertain to invasive species monitoring.

- Ecosystem Restoration Program (BRMD)—The Ecosystem Restoration Program provides policy, tools, and technical guidance necessary to restore disrupted ecological processes and degraded ecosystems. The program coordinates with the Disturbed Lands, Weed Management, and Hazardous Materials, Fire, and Facilities programs on projects they fund or conduct, integrating ecological issues into restoration efforts. Monitoring is crucial to the success of any restoration project and is typically integral to a restoration plan. Invasive species monitoring is tailored to meet the needs of particular restoration projects, or other management actions, such as hazard fuel reduction, and post-fire rehabilitation.
- Environmental Response, Damage Assessment, and Restoration Program (EQD)—ERDAR was established in 1993 to seek compensation from responsible parties to restore resources harmed, intentionally or unintentionally, to their pre-incident conditions. ERDAR staff provide assistance in the preparation of restoration plans and in carrying out restoration projects. Monitoring is essential to the evaluation of restoration projects. There are no standard monitoring protocols to track invasive species since monitoring goals, objectives, and protocols are tailored to each incident given its specific circumstances and resulting legal requirements. Invasive species monitoring concerns and costs are addressed in every applicable case. Particularly, monitoring must be designed to ensure that invasive species do not delay or alter restoration efforts.
- Exotic Plant Management Teams (BRMD)—EPMTs were established in FY 2000 through the Natural Resource Challenge. They are designed to provide a highly trained, mobile strike force of plant management specialists to assist parks in the control of exotic plants. EPMTs assist partner parks (defined through an initial proposal process) to control or contain exotic plant infestations to a maintenance level using an integrated pest management approach. Monitoring is not required of the EPMTs, but most EPMTs conduct monitoring. Monitoring intensity and frequency vary across the teams. Current funding, personnel, and time constraints do not allow the EPMTs to conduct intensive monitoring that would be required to accurately evaluate management effectiveness. Partner parks are expected to provide prevention and early detection of exotic species and to monitor and maintain sites after they have been treated by EPMTs as indicated in the original request for proposals. Not all parks are linked to an EPMT, and EPMT regions do not directly overlap with Inventory and Monitoring networks. Invasive species monitoring, if it were to be conducted by EPMTs, would be focused on the effectiveness of management actions and, perhaps, on monitoring restoration.
- Fire Ecology Program (Fire Mgt. Prog. Ctr.)—All parks with vegetation capable of burning are required to prepare a fire management plan for their fire management

programs. A crucial component of this plan is a fire monitoring program which allows the NPS to document basic information, to detect trends, and to ensure that the parks meet their fire and resource management objectives. To standardize methods across the NPS, the Fire program has developed a Fire Monitoring Handbook that provides guidance and methods for documenting, monitoring, and managing both wildland and prescribed fires. While invasive species are not directly addressed in the handbook, they often are and can be included in the methods described (e.g., Monitoring Immediate Postburn Vegetation or Monitoring Vegetation Characteristics). The importance of monitoring invasive species via fire monitoring should be communicated to the park's fire monitoring staff so that the fire monitoring plan can be adjusted accordingly. Certain standard techniques are mandatory, but others have the flexibility to be adapted to meet additional park management needs, including invasive species monitoring.

- Integrated Pest Management (BRMD)— The Federal Insecticide Fungicide and Rodenticide Act (FIFRA) of 1947 directed all federal agencies to incorporate Integrated Pest Management (IPM) practices; in 1979, President Carter issued a presidential memorandum directing all federal agencies to adopt IPM as the preferred method for managing pest species (including invasive species). IPM is a decision-making process that coordinates knowledge of pest biology, the environment, and available technology to prevent unacceptable levels of pest damage, by cost-effective means, while posing the least possible risk to people, resources, and the environment. The NPS implements an IPM Program to reduce risks to the public, park resources, and the environment from pests and pest related management strategies (NPS Management Policies 2001). Monitoring is required throughout the IPM process (NPS-77) and should include regular sampling of target and non-target populations as well as management decisions and ancillary data (e.g., weather, phenology). IPM also incorporates an evaluation process that is used to determine the efficacy and environmental effects of treatment actions and to identify modifications necessary to the success of the management program. Although steps to developing a monitoring program are outlined by the IPM program, monitoring methodologies are customized to fit project-specific variables. Regional and Washington Office coordinators advise on technical management strategies and are responsible for policy formulation and implementation.
- Inventory and Monitoring Vital Signs Program (NRID)—In FY 2000, the Natural Resource Challenge provided increased funding to accelerate inventories initiated in 1990 and to help develop and implement a new approach to monitoring. The new approach, Vital Signs Monitoring, is based on less intensive and more extensive (or comprehensive) monitoring than the complimentary research-based monitoring programs conducted by the prototypes. The program focuses on park networks (32) in which parks function cooperatively to address similar resource management issues within similar biogeographic regions. Resources and ecological processes to be monitored long-term are selected and then prioritized via input from resource managers, scientists, and interested stakeholders. The resulting Vital Signs indicators reflect the management needs and priorities of the network parks, and, therefore, may or may not include invasive species as an element to monitor. While the majority of networks have indicated that invasive species, particularly plants, are a monitoring priority, they are not a priority for all networks. Consequently, I&M funds are not available for invasive species monitoring in parks where invasive species were not prioritized as a Vital Signs indicator by the

network. Further, the I&M program is focused on monitoring the long-term, ecological integrity of park ecosystems. Therefore, invasive species monitoring would most likely focus on early detection, trends monitoring, restoration and recovery monitoring, and/or, to a lesser extent, the secondary effects of management actions. Monitoring for management effectiveness is not within the purview of the I&M program, although networks may decide to work closely with other programs to produce a comprehensive invasive species monitoring plan.

- Parks-- Exotic species are managed at the park level, with the superintendent, as advised by the park resource manager, ultimately responsible for the programs (NPS-77). Superintendents and resource managers depend on information provided by scientists to assist them in monitoring the park's resources. Some parks have worked closely with scientists and local managers to establish and implement invasive species monitoring plans. Other parks do not have invasive species monitoring projects in place. Historically, superintendents have sought advice, guidance, and technical assistance from regional and Washington Office coordinators of the respective NPS divisions or programs (e.g., IPM, restoration, exotic plant management, wildlife, etc.) More recently they also have called upon the expertise of network, regional, and national Inventory and Monitoring coordinators. While assistance has been provided to individual parks, networks, and regions for specific species or projects, a Servicewide set of invasive species monitoring guidelines and protocols have not been developed. They are currently in preparation.
- Water Resources Division (WRD)—WRD provides technical assistance and funding to parks in the areas of water rights, water quality, planning, floodplain and fishery management, watershed and wetland protection, policy and regulatory analysis, information management and interpretation, and training. WRD does not have formal standards for invasive species monitoring aside from accepted techniques found in the scientific and management literature. Monitoring is done on a case-by-case basis. For example, invasive species monitoring may be a component of wetland restoration projects to track the success of the project or a part of exotic fish species removal projects for the same reason. Similarly, invasive species monitoring may be built into technical assistance requests as per the request.
- Wildlife Management Program (BRMD)— The Wildlife Management Program provides professional and scientific wildlife management consultation, technical assistance, and policy guidance to manage native and exotic (invasive) wildlife (animal) species in units of the National Park Service. The Wildlife program, like many other NPS programs, has monitored exotic animals in parks and, to a lesser extent, carrying capacity and the impacts of exotic animals on their environment. This has been done on a case-by-case basis or as part of technical assistance requests. The program does not conduct routine monitoring of invasive species.